PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Venkat Selvamanickam		
Title:	HIGH-THROUGHPUT EX-SITU METHOD FOR RARE-EARTH-BARIUM-COPPER-OXIDE (REBCO) FILM GROWTH		
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Mail Stop Appeal Brief - Patents
The Board of Patent Appeal and Interferences
Commissioner for Patents
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BRIEF ON APPEAL

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This brief contains these items under the following headings, and in the order set forth below (37 C.F.R. § 41.37(c)(1)):

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The final page of this brief before the beginning of the Appendix of Claims bears the representative's signature.

I. REAL PARTY IN INTEREST (37 C.F.R. § 41.37(c)(1)(i))

Assignments from each of the inventors to the sole assignee, SuperPower, Inc., of 450 Duane Avenue, Schenectady, NY 12304, were recorded by the United States Patent and Trademark Office (USPTO) on April 29, 2004, at Reel/Frame:014579/0932. The real party of interest is SuperPower, Inc.

II. RELATED APPEALS AND INTERFERENCES (37 C.F.R. § 41.37(c)(1)(ii))

Appellant, Appellant's legal representatives, and Assignee know of no related appeals or interferences which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS (37 C.F.R. § 41.37(c)(1)(iii))

Claims 1-5 and 7-18, all of which are rejected and remain pending herein. Claim 6 was canceled in the Amendment filed July 19, 2006. Each of claims 1-5 and 7-18 is hereby appealed by Appellant.

IV. STATUS OF AMENDMENTS (37 C.F.R. § 41.37(c)(1)(iv))

No amendment was filed or entered after the Final Office Action mailed December 18, 2007.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER (37 C.F.R. § 41.37(c)(1)(v))

A concise explanation of the subject matter defined in each of the independent claims involved in the appeal is provided below.

A. Claim 1

Claim 1 is reproduced below for clarity.

1. A process for producing long lengths of a layered superconductor comprising:

a. coating a buffered metal substrate tape with precursors of $REBa_2Cu_3O_7$ where RE is a rare earth to form a coated tape, wherein coating is carried out during the process of metalorganic deposition (MOD);

b. translating the coated tape through a precursor conversion zone in a process chamber at a rate of at least about 10 meters per hour;

c. introducing oxygen and water vapor through a showerhead into the precursor conversion zone while translating the coated tape; and

d. heating the coated tape to a temperature in the range between about 700°C. to about 850°C.;

where the pressure in the process chamber is in the range between about 1 Torr to about 760 Torr and where the substrate resides in the precursor conversion zone for a period of time sufficient to convert the precursors to a superconducting coating epitaxial to the buffer layer.

As supported in the specification, the method for producing long lengths of a layered superconductor can include coating a buffered metal substrate tape with precursors to form a coated tape (paragraph [0023] of the Present Application), and translating the coated tape through a precursor conversion zone at a rate of at least about 10 meters per hour (paragraph [0037] of the Present Application). The precursors are precursors of $REBa_2Cu_3O_7$ where RE is a rare earth. The coating is carried out during the process of metalorganic deposition (MOD) (paragraph [0023] of the Present Application). Oxygen and water vapor can be introduced through a showerhead into the precursor conversion zone while translating the coated tape (paragraph [0036] of the Present Application). The coated tape can be heated to a temperature in the range between about 700°C to about 850°C (paragraph [0036] of the Present Application).

The pressure in the process change can be in the range between about 1 Torr to about 760 Torr (paragraph [0023] of the Present Application). The substrate resides in a precursor conversion zone for a period of time sufficient to convert the precursors to a superconducting coating epitaxial to the buffer layer (paragraph [0036] of the Present Application).

B. Claim 12

Claim 12 is reproduced below for clarity.

12. A process for producing long lengths of a layered superconductor comprising:

a. coating a buffered metal substrate tape with precursors of $REBa_2Cu_3O_7$ where RE is a rare earth to form a coated tape, wherein coating is carried out during the process of metalorganic deposition (MOD);

b. translating the coated tape through a precursor conversion zone in a process chamber at a rate of at least about 10 meters per hour;

c. introducing oxygen and water vapor through a showerhead into the precursor conversion zone while translating the coated tape, the showerhead having a width at least as wide as the sum of the widths of the translating coated tapes plus the sum of the distances between each of the translating coated tapes and having a length at least as great as the width; and

d. heating the coated tape to a temperature in the range between about 700°C. to about 850°C.;

where the pressure in the process chamber is in the range between about 1 Torr to about 760 Torr and where the substrate resides in the precursor conversion zone for a period of time sufficient to convert the precursors to a superconducting coating epitaxial to the buffer layer.

As supported in the specification, the method for producing long lengths of a layered superconductor can include coating a buffered metal substrate tape with precursors to form a coated tape (paragraph [0023] of the Present Application), and translating the coated tape through a precursor conversion zone at a rate of at least about 10 meters per hour (paragraph [0037] of the Present Application). The precursors can be precursors of $REBa_2Cu_3O_7$ where RE is a rare earth. The coating can be carried out during the process of metalorganic deposition

(MOD) (paragraph [0023] of the Present Application). Oxygen and water vapor can be introduced through a showerhead into the precursor conversion zone while translating the coated tape (paragraph [0036] of the Present Application). The showerhead can have a width at least as wide as the sum of the widths of the translating coated tapes plus the sum of the distances between each of the translating coated tapes and can have a length at least as great as the width (paragraph [0026] of the Present Application). The coated tape can be heated to a temperature in the range between about 700°C to about 850°C (paragraph [0036] of the Present Application). The pressure in the process change can be in the range between about 1 Torr to about 760 Torr (paragraph [0023] of the Present Application). The substrate resides in a precursor conversion zone for a period of time sufficient to convert the precursors to a superconducting coating epitaxial to the buffer layer (paragraph [0036] of the Present Application).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL (37 C.F.R. § 41.37(c)(1)(vi))

A. Appellant respectfully requests review of the rejection of claims 1-5, 8-13, and 15-18 under 35 U.S.C. § 103(a) over US Pat. 6,794,339 (hereinafter "Weismann") in combination with either US Pat. 4,962,085 (hereinafter "deBarbadillo") or US Pat. 5,206,216 (hereinafter "Yoshida") further in combination with US Pub. 2004/0163597 (hereinafter "Lee") further in combination with US Pub. 2005/0014653 (hereinafter "Reeves").

B. Appellant respectfully requests review of the rejection of claim 7 under 35 U.S.C. § 103(a) over Weismann in combination with either deBarbadillo or Yoshida further in combination with Lee further in combination with Reeves still further in combination with US Pat. 6,774,088 (hereinafter "Manabe") or US Pat. 6,083,885 (hereinafter "Weinstein").

C. Appellant respectfully requests review of the rejection of claim 14 under 35 U.S.C. § 103(a) over Weismann in combination with either deBarbadillo or Yoshida further in combination with Lee further in combination with Reeves still further in combination with US Pat. 5,278,138 (hereinafter "Ott").

VII. ARGUMENTS (37 C.F.R. § 41.37(c)(1)(vii))

A. At the outset, Appellant respectfully submits that the rejections of the claims in the Final Office Action are defective because Lee does not qualify as prior art. The earliest date for which Lee can be used as a prior art reference is Feb 24, 2004, which is after the filing of the Present Application (December 15, 2003). For the sake of completeness, Appellant is addressing the rejections, even though all rejections rely on Lee.

B. Claims 1-5, 8-13, and 15-18 would not have been obvious under 35 U.S.C. § 103(a) over Weismann in combination with either deBarbadillo or Yoshida further in combination with Lee further in combination with Reeves.

1. Claims 1-5, 8-11, and 15-18 are allowable over Weismann in combination with either deBarbadillo or Yoshida further in combination with Lee further in combination with Reeves.

The USPTO has the burden of establishing a *prima facie* case of obviousness. *See generally*, MPEP §§ 2142 and 2143. In particular, the USPTO has not made a sufficient finding that the claimed method would have had a reasonable likelihood of success. "Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*, 75 F.R. 57526, 57534 (2007) (hereinafter "Examination Guidelines"); *In re Dow Chemical Co.,* 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529 (Federal Circuit 1989). Moreover, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *KSR Int'l v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007). As will be discussed in more detail below, the USPTO has failed to show that one of ordinary skill in the art would have expected a reasonable likelihood of success and that the expectation of success must be founded in the prior art, not in the Present Application. Therefore, the USPTO has failed to establish a *prima facie* case of obviousness.

Claim 1 is directed to a method of producing long lengths of a layered superconductor. Claim 1 includes coating a buffered metal substrate tape with precursors of $REBa_2Cu_3O_7$ during the process of metalorganic deposition. Claim 1 further requires translating the coated tape

through a precursor conversion zone at a rate of at least about 10 meters per hour and introducing oxygen and water vapor are into the conversion zone through a showerhead, where the substrate resides in the precursor conversion zone for a time period sufficient to convert the precursors into a superconducting coating. Achieving a throughput of at least about 10 meters per hour for an *ex-situ* process is significant in this regard.

There are a number of techniques for forming a superconducting coating on a substrate. These techniques can be classified as *ex-situ* processes and *in-situ* processes. In an *in-situ* process, such as pulsed laser deposition (PLD), sputtering, and metalorganic vapor deposition (MOCVD), growth of the superconducting coating occurs in a single step. *In-situ* processes do not require a separate conversion reaction and can deposit a superconducting film at a rate of up to 1-5 microns per minute. The *in-situ* processes are will suited for high-throughput applications. *See,* Paragraphs [0006] and [0011] of the Present Application.

Unlike the *in-situ* processes, *ex-situ* processes are significantly slower processes because the chemical reactions that form a superconducting coating using *ex-situ* processes are different from the *in-situ* processes. In an *ex-situ* process, such as metalorganic deposition (MOD), spray pyrolysis, and BaF_2 post annealing, precursors are deposited atop a substrate and subsequently undergo a separate chemical reaction that converts the precursors to a superconducting coating (paragraph [0007] of the Present Application). The conversion reaction required in the *ex-situ* process occurs on the order of 1 Angstrom per second, which is about three orders of magnitude slower than an *in-situ* process. Utilizing different precursor chemicals alters the chemical reaction for conversion to a superconductor material in this inherently unpredictable art. In a particular MOD process, trifluoroacetic acid complexes of rare-earth, barium, and copper are mixed in a solvent and applied to the substrate, such as by dipcoating. In order to form the superconductor layer, the organics are baked off, and the remaining material undergoes a separate annealing process to crystallize into a superconducting layer. Alternatively, in a particular BaF_2 post annealing process, a metal containing layer is formed by the deposition of rare-earth, barium fluoride and copper metals. The metal containing layer is oxidized in the presence of water vapor and oxygen and undergoes a separate annealing process to form the superconducting layer.

Clearly, one of ordinary skill in the art would have understood that a throughput rate of an *ex-situ* process cannot be predicted using a throughput rate of an *in-situ* process because the chemistry in forming the superconducting layers are different in this unpredictable art, and that a separate operation is required for the *ex-situ* process to yield a superconducting layer, whereas, the *in-situ* process does not require this separate operation.

The USPTO relies upon Weismann to teach particular portions of claim 1. Weismann discloses an *ex-situ* process including forming a precursor film and heat treating the precursor film at sub-atmospheric pressures in the presence of oxygen and water vapor (Weismann in Abstract). Specifically, Weismann utilizes the BaF_2 post anneal process in which a precursor film consisting of BaF_2, Y, and Cu is deposited onto a substrate using vapor deposition (Weismann at col. 4, line 59 through col. 5 line 4). During the heat treatment step, the superconducting film grows at a rate of from about 1 to about 20 Angstroms per second (Weismann at col. 4, lines 20-22). The USPTO states Weismann fails to teach a process utilizing coated tapes. Therefore, Weismann does not teach translating a coated tape through a precursor conversion zone in a process chamber at a rate of at least about 10 meters per hour.

The USPTO relies on DeBarbadillo or Yoshida to allegedly suggest modifying the <u>*ex-situ*</u> process of Weismann to include translating a coated tape though a conversion zone. DeBarbadillo discloses a metal superconductor precursor layered on a metal substrate (DeBarbadillo at col. 4, lines 18-31). The metal substrate can include tapes, ribbons, and wire. (DeBarbadillo at Abstract, Fig. 1, and col. 1, lines 1-15). Yoshida discloses an <u>*in-situ*</u> pulsed laser deposition (PLD) method for depositing a superconducting film on a metal tape (Yoshida in Abstract). A laser is utilized to vaporize superconductive material from a target of superconductive material (Yoshida at col. 2, lines 22-25). The vaporized material is deposited on a metal tape that is translated through a deposition zone (Yoshida at col. 4, lines 13-20 and lines 37-47). The superconductor film is allowed to slowly cool under a relatively high pressure of oxygen, so that a superconducting wire having uniform characteristics is obtained (Yoshida at Fig. 3 and col. 5, lines 46-53). Yoshida teaches that PLD is particularly suited for fabrication of long lengths of tape and can achieve a throughput of about 5 cm/min to 50 cm/min (3 to 30 meters/hour) due to the high deposition rate of PLD (Yoshida at col. 2, lines 60-69).

Further, the USPTO acknowledges that Weismann in combination with DeBarbadillo or Yoshida fail to teach the use of a showerhead to supply oxygen and water vapor. As such, the USPTO relies on Lee to allegedly suggest modifying the *ex-situ* process of Weismann in combination with DeBarbadillo or Yoshida to include introducing oxygen and water vapor through a showerhead. Lee discloses an *in-situ* method using metalorganic chemical vapor deposition (MOCVD) to deliver precursor gases and oxygen in order to deposit thin films on a semiconductor wafer (Lee at paragraphs [0003]-[0004]).

The USPTO apparently relies upon Reeves to allegedly suggest modifying the teachings of Weismann, DeBarbadillo or Yoshida, and Lee to include translating at a rate of at least about 10 meters per hour. Reeves discloses an *in-situ* method including translating a tape through a deposition chamber at a rate of between 0.3 meters/hr and 10 meters/hr (Reeves at paragraph [0063]). Reeves discloses forming the superconductor layer using *in-situ* processes such as PLD and CVD. Specifically, Reeves teaches that PLD can be used to achieve a high deposition rate and that CVD can be used for deposition over large areas at a lower cost (Reeves at paragraph [0037]).

There must be some articulate reasoning with some rational underpinning to support the legal conclusion of obviousness. *Ex parte Wada and Murphy,* BPAI Appeal No. 2007-3733 (January 14, 2008). *In-situ* and *ex-situ* processes are inherently different, and the chemical reaction required for conversion in an *ex-situ* process in inherently unpredictable. At least some degree of predictability is required to support a finding of obviousness. *See generally*, MPEP §§ 2143.02. The USPTO suggests that it would be obvious to increase the rate of translation based on the teachings of Reeves (*in-situ* process). However, one of ordinary skill in the art would have recognized that *in-situ* processes and *ex-situ* processes form superconducting films at significantly different rates using significantly different chemistries. Yoshida and Reese clearly suggest that *in-situ* processes with high deposition rates are better suited for fabrication of superconducting wire at high speeds, such as in a method including translating at a rate of at least about 10 meters per hour. The USPTO has failed to show that one of ordinary skill in the art would have expected to obtain a functional product when accelerating the translation rate, particular when using an *ex-situ* process. Indeed, based on the conversion rates and absent

Appellant's own disclosure, one of ordinary skill in the art would have expected an incomplete conversion and a nonfunctional product when applying the translation rate of an *in-situ* process, such as the one in Reeves, to an *ex-situ* process, such as the one in Weismann or deBarbadillo. Additionally, the chemical reaction required for conversion is inherently unpredictable, and the *ex-situ* processes of Weismann and deBarbadillo do not provide an expectation of success when using MOD. In absence of Appellant's disclosure, one of ordinary skill in the art, would have not have expected an *in-situ* process, such as PLD or CVD, to predict translating at a rate of at least about 10 meters per hour using an *ex-situ* MOD process.

Additionally, the USPTO provides no motivation, absent Appellant's own disclosure, to combine the showerhead of Lee (*in-situ* process) with the *ex-situ* process of Weisman. Lee utilizes a showerhead for the even distribution of precursor gases in order to evenly deposit a superconducting layer up the substrate. In the case of an *ex-situ* process, the precursor layer has been uniformly applied to the substrate <u>prior</u> to the conversion step. Accordingly, one of ordinary skill in the art would not have been motivated to utilize a showerhead during a post-deposition conversion. Additionally, the prior art fails to recognize the importance of uniform distribution of water vapor and oxygen throughout the conversion zone.

Appellant respectfully submits that the USPTO has not provided a proper factual finding that Weismann, deBarbadillo, Yoshia, Lee, and Reeves, individually or in combination, teach, suggest, or provide motivation to achieve the claimed method including translating a coated tape through a conversion zone (i) at a rate of at least about 10 meters per hours and (ii) for a period of time sufficient to convert the precursor to a superconductor coating. Additionally, the USPTO has not provided a proper factual finding that Weismann, deBarbadillo, Yoshia, Lee, and Reeves, individually or in combination, would have taught, suggested, or provided motivation for one of ordinary skill in the art to achieve the claimed method including introducing oxygen and water vapor through a showerhead into a precursor conversion zone while translating the coated tape through the precursor conversion zone. As such, the USPTO has failed to establish a *prima facie* case of obviousness with respect to claim 1 because the USPTO has failed to show that one of ordinary skill in the art would have had a reasonable expectation of success founded in legally proper findings in the prior art. Appellant respectfully submits that claim 1 is allowable over the

combination of Weismann, deBarbadillo, Yoshia, Lee, and Reeves. Claims 2-5, 8-11, and 15-18 depend directly or indirectly from claim 1 and are allowable for at least the same reasons as claim 1. Therefore, Appellant respectfully requests the Board to reverse the rejection of claims 1-5, 8-11, and 15-18 for failure to establish a *prima facie* case of obviousness.

2. Claim 12 is allowable over Weismann in combination with either deBarbadillo or Yoshida further in combination with Lee further in combination with Reeves.

The USPTO has the burden of establishing a *prima facie* case of obviousness, which requires the prior art references must teach each and every claim limitation. See generally, MPEP §§ 2142 and 2143. In particular, to establish a *prima facie* case of obviousness of the claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka,* 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974). As will be discussed in more detail below, the USPTO has failed to prove that all the claim limitations can be found in the combination of Weismann, deBarbadillo, Yoshida, Lee, and Reeves. Therefore, the USPTO has failed to establish a *prima facie* case of obviousness.

Claim 12 is directed to a method of producing long lengths of layered superconductors. Claim 12 includes coating a buffered metal substrate tape with superconductor precursors during the process of metalorganic deposition. Claim 12 further requires translating the coated tape through a conversion zone at a rate of at least about 10 meters per hour and introducing oxygen and water vapor are into the conversion zone through a showerhead while translating the coated tape to convert the precursors into a superconducting coating. The showerhead has (i) a width at least as wide as the sum of the widths of the translating coated tapes plus the sum of the distances between each of the translating coated tapes and (ii) a length at least as great as the width.

As discussed above with reguard to claim 1, Weismann, deBarbadillo, Yoshida, Lee and Reeves, individually or in combination, fail to teach, suggest, or motivate one of ordinary skill in the art to achieve the claimed method including translating a coated tape through a conversion zone (i) at a rate of at least about 10 meters per hours, and (ii) for a period of time sufficient to

convert the precursor to a superconductor coating. On this basis alone, the obviousness rejection of claim 12 should be reversed.

The obviousness rejection can be reversed on an additional ground, namely introducing oxygen and water vapor through a showerhead having (i) a width at least as wide as the sum of the widths of the translating coated tapes plus the sum of the distances between each of the translating coated tapes and (ii) a length at least as great as the width. The USPTO has relied upon Lee to apparently teach the use of a showerhead for delivery of gases to a substrate. Lee discloses a circular showerhead for depositing metal organic precursors and oxygen to a circular wafer rather than a translating tape. The USPTO has provided no motivation, absent Appellant's own disclosure, to modify the showerhead of Lee to have (i) a width at least as wide as the sum of the widths of the translating coated tapes plus the sum of the distances between each of the translating coated tapes and (ii) a length at least as great as the width.

Appellant respectfully submits that the USPTO has not provided a proper factual finding that Weismann, deBarbadillo, Yoshia, Lee, and Reeves, individually or in combination, teach, suggest, or provide motivation to achieve the claimed method including introducing oxygen and water vapor through a showerhead having (i) a width at least as wide as the sum of the widths of the translating coated tapes plus the sum of the distances between each of the translating coated tapes and (ii) a length at least as great as the width. As such, the USPTO has failed to establish a *prima facie* case of obviousness with respect to claim 12 because not all claim limitations are found in the references. Appellant respectfully submits that claim 12 is allowable over Weismann, deBarbadillo, Yoshia, Lee, and Reeves. Therefore, Appellant respectfully requests the Board to reverse the rejection of claim 12 for failure to establish a *prima facie* case of obviousness.

3. Claim 13 is allowable over Weismann in combination with either deBarbadillo or Yoshida further in combination with Lee further in combination with Reeves.

In addition to the reasons explained with respect to claim 1, claim 13 is allowable over Weismann in combination with either deBarbadillo or Yoshida further in combination with Lee further in combination with Reeves for at least another reason. Claim 13 includes a further

limitation that reaction by-products are removed from the process chamber by a pumping system located proximate to the precursor conversion zone. Appellant discovered locating the pumping system proximate to the precursor conversion zone enabled better handling of the high gas loads. Additionally, the combination of the showerhead to inject oxygen and water vapor and the use of a pumping system close to the conversion zone enables a uniform flow pattern necessary for uniform film growth over large areas, paragraphs [0031]-[0033] of the Present Application.

While Weismann discloses a pumping system to remove by-products, Weismann describes a vaccum processing apparatus where the exhaust port is located at the opposite end of a quartz tube from the gas inlet (Weismann at FIGs. 2 and 3 and col. 7, line 62 through col. 8, line 11). Similarly, Lee discloses an apparatus where the pump is located near one end of the deposition chamber (Lee at FIGs. 1-4, 6, and 8). Appellant discovered that conventional furnaces, similar to that described by Weismann and Lee, were inadequate for handling the large gas loads and attaining uniform distribution. Further, deBarbadillo, Yoshida, and Reeves are silent on the location of a pumping system. Absent Appellant's own discloser, the USPTO provides no motivation to locate the pumping system proximate to the precursor conversion zone.

Appellant respectfully submits that the USPTO has not provided a proper factual finding that Weismann, deBarbadillo, Yoshia, Lee, and Reeves, individually or in combination, would have taught, suggested, or provided motivation to achieve the claimed method including translating a coated tape through a precursor conversion zone in a processing chamber wherein reaction by-products are removed from the process chamber by a pumping system located proximate to the precursor conversion zone. As such, the USPTO has failed to establish a *prima facie* case of obviousness with respect to claim 13 because not all claim limitations are found in the references. Appellant respectfully submits that claim 13 is allowable over Weismann, deBarbadillo, Yoshia, Lee, and Reeves. Therefore, Appellant respectfully requests the Board to reverse the rejection of claim 13 for failure to establish a *prima facie* case of obviousness.

C. Claim 7 would not have been obvious under 35 U.S.C. § 103(a) over Weismann in combination with either deBarbadillo or Yoshida further in combination with Lee further in combination with Reeves still further in combination with Manabe or Weinstein.

Claim 7 depends directly from claim 1 and is allowable for at least the same reasons as claim 1. Therefore, Appellant respectfully requests the Board to reverse the rejection of claim 7 for failure to establish a *prima facie* case of obviousness.

D. Claim 14 would not have been obvious under 35 U.S.C. § 103(a) over Weismann in combination with either deBarbadillo or Yoshida further in combination with Lee further in combination with Reeves still further in combination with Ott.

Claim 14 depends directly from claim 1 and is allowable for at least the same reasons as claim 1. Therefore, Appellant respectfully requests the Board to reverse the rejection of claim 14 for failure to establish a *prima facie* case of obviousness.

VIII. CONCLUSION

For at least the foregoing reasons, Appellant respectfully requests the board to review and reverse the grounds for rejection subject to appeal.

Respectfully submitted,

5/18/08
Date

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IX. APPENDIX 1: CLAIMS INVOLVED IN THE APPEAL (37 C.F.R. § 41.37(c)(1)(viii))

The text of each claim involved in the appeal is as follows:

1. A process for producing long lengths of a layered superconductor comprising:

a. coating a buffered metal substrate tape with precursors of $REBa_2Cu_3O_7$ where RE is a rare earth to form a coated tape, wherein coating is carried out during the process of metalorganic deposition (MOD);

b. translating the coated tape through a precursor conversion zone in a process chamber at a rate of at least about 10 meters per hour;

c. introducing oxygen and water vapor through a showerhead into the precursor conversion zone while translating the coated tape; and

d. heating the coated tape to a temperature in the range between about 700°C. to about 850°C.;

where the pressure in the process chamber is in the range between about 1 Torr to about 760 Torr and where the substrate resides in the precursor conversion zone for a period of time sufficient to convert the precursors to a superconducting coating epitaxial to the buffer layer.

2. The process of claim 1 where the substrate is selected from the group consisting of stainless steel and nickel alloys.

3. The process of claim 1 where the substrate is biaxially textured.

4. The process of claim 1 where the buffer on the metal substrate tape is selected from the group consisting of YSZ, CeO_2, MgO, $SrTiO_3$, $LaMnO_3$, $SrRuO_3$, Y_2O_3, Gd_2O_3, $LaSrMnO_3$ and combinations thereof.

5. The process of claim 1 where the pressure in the process chamber is in the range between about 10 Torr to about 760 Torr.

7. The process of claim 1 where the atmosphere in the process chamber has a dew point between about 40°C. to about 80°C.

8. The process of claim 1 where a partial pressure of water vapor in the process chamber is between about 1 Torr and about 50 Torr.

9. The process claim 1 where the oxygen is introduced through the showerhead with a carrier gas, an oxygen content in the carrier gas ranging between about 10 ppm and 10%.

10. The process of claim 1 where a partial pressure of the oxygen and water vapor is substantially consistent throughout the precursor conversion zone.

11. The process of claim 1 where the distribution of the oxygen and water vapor is uniform throughout the precursor conversion and film growth zone.

12. A process for producing long lengths of a layered superconductor comprising:

a. coating a buffered metal substrate tape with precursors of $REBa_2Cu_3O_7$ where RE is a rare earth to form a coated tape, wherein coating is carried out during the process of metalorganic deposition (MOD);

b. translating the coated tape through a precursor conversion zone in a process chamber at a rate of at least about 10 meters per hour;

c. introducing oxygen and water vapor through a showerhead into the precursor conversion zone while translating the coated tape, the showerhead having a width at least as wide as the sum of the widths of the translating coated tapes plus the sum of the distances between each of the translating coated tapes and having a length at least as great as the width; and

d. heating the coated tape to a temperature in the range between about 700°C. to about 850°C.;

where the pressure in the process chamber is in the range between about 1 Torr to about 760 Torr and where the substrate resides in the precursor

conversion zone for a period of time sufficient to convert the precursors to a superconducting coating epitaxial to the buffer layer.

13. The process of claim 1 wherein reaction by-products are removed from the process chamber by a pumping system located proximate to the precursor conversion zone.

14. The process of claim 1 wherein the process chamber is a cold-wall chamber.

15. The process of claim 1, wherein the showerhead has a plurality of fine openings through which the oxygen and water vapor pass.

16. The process of claim 15, wherein the fine openings are evenly spaced.

17. The process of claim 1, wherein translating occurs at a rate between 10 and 400 meters per hour.

18. The process of claim 12, wherein translating occurs at a rate between 10 and 400 meters per hour.

X. EVIDENCE APPENDIX (37 C.F.R. § 41.37(c)(1)(ix))

No evidence was submitted by Appellant pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132.

XI. RELATED PROCEEDINGS APPENDIX (37 C.F.R. § 41.37(c)(1)(x))

Appellant, Appellant's legal representatives, and Assignee are aware of no decisions that have been rendered by a court or the Board.